

REMARKS

This amendment is being presented in response to the Examiner's action of February 16, 2003. The Examiner has indicated that claims 1-28 have been rejected. In light of the amendments and the following detailed arguments, it is respectfully submitted that the claims fully distinguish over the applied prior art.

Claims 5 and 6 have been amended herein to correct a grammatical error noted in each of those claims. No changes have been made to the scope of the claims.

It is noted that the IDS of October 31, 2000, has never been acknowledged by the Examiner. Consideration of this IDS, which was timely filed and was acknowledged by the USPTO, is respectfully requested. An additional IDS is being submitted herewith, including art cited in the corresponding International Search Report.

Claims 1-5, 8-10 and 12-16 have now been rejected under 35 USC §102(e) as being anticipated by U.S. Patent No. 6,231,971 to Terneu. The Examiner indicates that Terneu teaches a glazing panel having various solar screening properties.

Claim 17 is rejected under 35 USC §103(a) as being unpatentable over Terneu. The Examiner states that Terneu teaches that fluorine doped tin oxide may be used in the application of an antimony doped tin oxide layer with a thickness of 100-500 nm. The Examiner noted that Terneu does not explicitly teach a thickness between 2000 and 3500 Angstroms.

The Examiner continues to reject claims 1-21 under 35 USC §103 as being unpatentable over McCurdy (U.S. Patent No. 5,780,149) in view of Terneu et al. The Examiner stated that McCurdy teaches a coated glass article comprising a 3 mm thick substrate with first and second

coatings, one of which coatings is an antimony doped tin oxide coating, wherein the glass article exhibits a selectivity of 10 or greater. The Examiner acknowledges that McCurdy is silent as to the second coating being fluorine doped tin oxide deposited on and adhering to the coating of antimony doped tin oxide. The Examiner attests that the Terneu reference disclosed that the inclusion of a fluorine doped tin oxide layer on an antimony doped layer provided a low solar factor and emissivity. The Examiner therefore asserts that it would have been obvious to one skilled in the art to replace the second layer with a fluorine doped tin oxide layer.

Claims 22-25 also continue to be rejected over the combination of McCurdy and Terneu. The Examiner indicated that McCurdy shows an insulating glass stack with an insulating unit comprising first and second glass substrates, a multi-layer coating stack with at least first and second coatings, one of which is a coating of antimony-doped tin oxide, wherein the glass article exhibits a selectivity of 10 or greater. The Examiner further avers that the McCurdy reference teaches that the thickness of the first and second layers is dependent upon the desired solar performance of the stack. The Examiner states that Terneu discovered that the inclusion of a fluorine doped tin oxide layer on an antimony doped tin oxide layer provided a low solar factor and emissivity. The Examiner thus concluded that one of ordinary skill in the art would replace the second layer of McCurdy with the fluorine doped layer of Terneu, in order to obtain lower solar factors and emissivities.

The Examiner additionally continues to reject claims 26-28 under 35 USC §103 as being unpatentable over McCurdy in view of Terneu. The Examiner avers that McCurdy teaches a coated glass article comprising the substrate with a 3mm thickness and at least first and second

coatings one of which contains antimony doped tin oxide, wherein the glass article exhibits a selectivity of ten or greater. McCurdy teaches that the thickness of the first and second layers is dependent upon the desired solar performance of the stack. The Examiner acknowledges that McCurdy is silent as to the second coating being fluorine doped tin oxide. The Examiner thus concludes that it would have been obvious to one skilled in the art to modify the glass article of McCurdy with the teachings of Terneu, to provide thicknesses within the claimed ranges to affect the solar performance.

Before discussing the prior art in detail, applicants again wish to discuss the present invention as defined in the independent claims. Independent claim 1 defines a coated glass article comprising a glass substrate, a coating of antimony doped tin oxide depositing on and adhering to said glass substrate. An additional coating of fluorine doped tin oxide is deposited on and adheres to the first coating. The thicknesses of the coatings are selected to provide a selectivity of thirteen or more.

Independent claim 22 defines an insulating glass unit. The insulating glass unit comprises first and second glass substrates with a multilayer coating stack deposited on the second glass substrate. A first coating of antimony doped tin oxide is deposited on the surface with a second coating of fluorine doped tin oxide deposited on and adhering to the first coating. The second glass substrate exhibits a difference between visible light transmittance and total solar energy transmittance of thirteen or more.

Independent claim 26 also describes a coated glass article comprising a substrate, a coating of antimony doped tin oxide, and a coating of fluorine doped tin oxide deposited on and

adhering to the coating of antimony doped tin oxide.

With regard to the rejection over Terneu alone, it is respectfully submitted that Terneu does not anticipate claim 1. Specifically, Terneu does not anticipate that "the thickness of said coatings selected so that said coated glass article exhibits a difference between visible light transmittance (Illuminant C) and total solar energy transmittance, integrated with an air mass 1.5 on a clear glass substrate at a nominal 3 mm thickness, to provide a selectivity of 13 or more".

It is respectfully submitted that Terneu is totally silent regarding the thickness of any possible fluorine doped tin oxide layer. Further, Terneu discusses the thickness of the antimony/tin oxide layer *only in the context of that layer alone, not in combination with another layer*, for example, a fluorine doped tin oxide layer. Therefore, Terneu certainly does not anticipate this language of claim 1. Further, there is no reason to expect that the thickness of the antimony/tin oxide layer would be the same if the layer were used alone would be the same as the thickness of the antimony/tin oxide layer if it were used in conjunction with a fluorine doped tin oxide layer.

While the Examiner has noted listed that claims 6 and 7 have been rejected under Terneu, these claims are referenced in paragraph 11 of the Office Action. Applicant disagrees with the Examiners assertion that that the thickness of the combination applies to the layer of fluorine doped tin oxide. As stated above, a layer of fluorine doped tin oxide over a layer of tin/antimony oxide would not be expected, by one skilled in the art, to have the same physical or optical properties of a layer of tin/antimony oxide further containing a fluorine dopant. The 100 to 500 nm layer referenced by the Examiner is for a tin/antimony oxide layer used as a single layer.

Even if this thickness applied to a tin/antimony layer doped with fluorine it certainly would not apply to a fluorine doped tin oxide layer deposited above a tin/antimony layer.

It is therefore submitted that Terneu teaches or suggests nothing regarding the thicknesses of these layers in conjunction when used together. Therefore, the subject matter of claim 1 describing the relative thicknesses of the layers is not anticipated by Terneu. OK

With regard to the rejections under 35 USC §103, which are all based upon the McCurdy reference in view of the Terneu reference, the Examiner notes in paragraphs 32 and 33 of the action:

Regarding Applicant's discussion on visible spectrum and spectral transmittances of McCurdy, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise have been obvious.

Ex Parte Obiaya

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. *See in re Fine*

In this case it is immaterial that McCurdy teaches an undoped layer of tin/antimony, when Terneu cures this deficiency.

As stated before, the McCurdy reference discloses a glass article having a solar control coating for architectural windows. The article includes a glass substrate and an iridescence suppressing interlayer deposited on and adhering to the surface of the glass substrate. The article further comprises first and second transparent coatings deposited on the iridescence suppressing interlayer. Applicants again note that McCurdy *requires* that the first and second transparent

coatings are chosen such that the difference in the refractive indices of the coatings in the near infrared region are greater than the difference of the refractive indices of the coatings in the visible region. (See, for example, McCurdy column 3, lines 9-18 and column 5, lines 18-34.) The selection results in an architectural glazing which rejects solar energy in the near infrared region while permitting the transmittance of a high degree of visible light. **Applicants continue to assert that the selection of the coatings based on these criteria is *essential to the stated purpose of the McCurdy reference.***

McCurdy describes his invention as follows:

In accordance with the present invention, there is provided a novel glass article useful for producing coated, heat reducing glass for architectural windows. The coated article includes a glass substrate, *an iridescence-suppressing interlayer* deposited on and adhering to the surface of the glass substrate, at least *a first transparent coating* deposited on and adhering to the surface of the iridescence-suppressing coating, and at least *a second transparent coating* deposited on and adhering to the surface of the first transparent coating. The use of the present inventive article in architectural glazings results in a glazing that rejects solar energy while permitting the transmittance of a high degree of visible light. The specific coating stack on a clear glass substrate provides an iridescence free coated article having a *high visible light transmittance and a reduced total solar energy transmittance.*

Column 2, lines 45-61, emphasis added.

McCurdy goes on to state:

The present invention utilizes at least a first transparent coating and a second transparent coating that have a difference in refractive indices in the near infrared region greater than a difference in refractive indices in the visible light region. The difference in refractive indices in the near infrared region provides an interface that serves to reflect near infrared radiation. The similar refractive indices in the visible region permits the transmittance of a high degree of visible light. The attenuation of near infrared energy results in a coated article having a reduced solar energy transmittance.

Column 3, lines 28-31.

Thus, the essential function of the McCurdy reference is to produce an architectural glass with energy transmission in the visible range greater than energy transmission in the IR range. This is accomplished by depositing first and second coatings on an iridescence suppressing interlayer on a glass substrate, which coatings are designed to provide optical interference in the near IR spectrum, and to provide relatively less optical interference in the visible spectrum. This is done by utilizing layers having refractive indices which are generally similar in the visible spectrum and which differ in the infrared spectrum.

Regarding these refractive indices, McCurdy notes, in column 3, lines 18-25, that:

The first transparent coating is **generally a doped metal oxide, a doped mixed metal oxide, or metal nitride**. The second transparent coating is **generally a metal oxide or mixed oxide with silica**. The selection of the first and second transparent coatings is made in accordance with prescribed refractive indices to produce the desired transmittance properties. The noted coatings may also possess a low emissivity to minimize heat gain in an architectural glazing.

Thus, the function of the McCurdy reference is accomplished by depositing an iridescence suppressing interlayer on a substrate, followed by a doped metal or mixed metal oxide, followed by an undoped layer.

As indicated previously, the refractive indices of $\text{SnO}_2\text{:F}$ and $\text{SnO}_2\text{:Sb}$ are very similar in both the visible and in the near infrared regions. A copy of this previously submitted chart is again submitted for the convenience of the Examiner. Based on the forgoing, the inclusion, in the McCurdy reference, of a fluorine doped tin oxide layer adjacent to the antimony doped tin oxide layer would not be obvious to one skilled in the art, as this would be contrary to the

purpose of the McCurdy reference. In fact, as stated previously, the inclusion of such a layer would render the McCurdy reference inoperable for its intended purpose, that is to allow the transmission of visible light, while reducing the transmission of near infrared radiation.

In *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984), the CAFC reasoned that the prior art reference taught away from the board's proposed modification. The court held that *if* the prior art reference were modified as proposed (turned upside down) that "it would be rendered inoperable for its intended purpose." (221 USPQ1125, 1127.) Thus, where a modification to a reference renders the reference unsuitable for its intended purpose, the CAFC has indicated that such purpose is significant, and that the proposed modification is improper.

It is respectfully submitted that the teaching of *In re Gordon* is directly applicable to the present application. Adding the fluorine doped tin oxide layer of Terneu to the invention of McCurdy would render McCurdy inoperative for its stated purpose, which is to maximize the transmission of visible light while blocking near infrared radiation by utilizing a pair of coatings that have similar refractive indices in the visible range and differing refractive indices in the near infrared region. Thus, not only would one skilled in the art have no motivation to combine the references, such combination is improper, and against well established law.

In the outstanding Office Action, the Examiner again indicates that "regarding the discussion on visible spectrum and spectral transmittances of McCurdy the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would have otherwise have been obvious." (*Ex parte Obiaya*, emphasis added.) As discussed above, applicants respectfully

assert that the combination of McCurdy and Terneu would *not have been obvious* to one skilled in the art, as the purpose of the McCurdy reference would have been destroyed by the combination with Terneu, in light of the teachings of *Gordon*. The combination of Terneu and McCurdy, as clearly shown by the teachings of *Gordon*, is **impermissible**. As the combination is not obvious, and in fact is impermissible, it is respectfully submitted that the *Obiaya* holding is not applicable to the present invention.

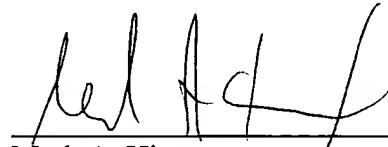
The Examiner also stated that "it is immaterial that McCurdy teaches an undoped layer of tin/antimony, when Terneu cures this deficiency." Far from being immaterial, this teaching is a requirement to the intended purpose of McCurdy. This "cure" suggested by the Examiner completely destroys the functionality of the McCurdy reference for its intended purpose. This is an impermissible combination under 35 USC §103.

Based upon the above, it is submitted that the combination of McCurdy and Terneu is improper and should be withdrawn.

The dependent claims 2-21, 23-25, and 27-28, are believed to be allowable based, at least, upon their dependence on allowable base claims as discussed above.

In view of the above remarks, a favorable reconsideration of the present application and the passing of this application to issue with all claims allowed are courteously solicited. If the Examiner wishes to modify any of the language of the claims in an effort to move the application towards allowance, a telephone call to the undersigned would be greatly appreciated.

Respectfully submitted,



Mark A. Hixon
Registration No. 44,766

ATTORNEYS
Marshall & Melhorn, LLC
Four SeaGate - 8th Floor
Toledo, Ohio 43604
(419) 249-7114